



# **NAVAL POSTGRADUATE SCHOOL**

**MONTEREY, CALIFORNIA**

## **THESIS**

**ANALYSIS OF THE U.S. NAVY'S GOAL-BASED  
AWARDS SYSTEM AND ITS EFFECT ON RECRUIT  
QUALITY**

by

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March 2013

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**ANALYSIS OF THE U.S. NAVY'S GOAL-BASED AWARDS  
SYSTEM AND ITS EFFECT ON RECRUIT QUALITY**

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## **ABSTRACT**

Commander Navy Recruiting Command (CNRC) has changed the Awards and Incentives system in recent years in an effort to increase recruiter productivity and promote recruit quality goal achievement. The latest awards and incentive system updates have placed increased emphasis on recruit quality in support of Navy Recruiting Command's strategic plan *Recruit Force 2020*. This thesis provides a detailed overview of the current Navy awards and incentives system. The thesis also attempts to estimate the effect of specific awards on the quality of recruit contracts. Furthermore, this thesis estimates the effect of monthly goaling targets on the quality of recruits. The objective is to determine if the current Navy awards and incentive system has an unintended consequence of reducing recruit quality. The analysis tests whether recruiters sacrifice quality as the end of the month approaches to meet their monthly goaling deadline. Also, the analysis tests the impact of Gold Wreath award on recruiter productivity and recruit quality. The results indicate that recruit quality tends to fall as the end-of-the-month approaches, specifically during the last week of the month. However, the results did not support the hypothesis that recruiters sacrifice quality to obtain their first Gold Wreath award.

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

AAA	Admiral's Accelerator Award
AC	Active Component
AFQT	Armed Forces Qualification Test
AFRS	Air Force Recruiting Service
API	Asian-Pacific Islanders
ASVAB	Armed Services Vocational Aptitude Battery
AVF	All-Volunteer-Force
CANREC	Canvasser Recruiters
CNA	Center for Navy Analysis
CNP	Chief of Naval Personnel
CNRC	Commander Navy Recruiting Command
CNRF	Commander Navy Reserve Force
CNSWC	Commander Navy Special Warfare Command
CO	Commanding Officer
DEP	Delayed Entry Program
DoD	Department of Defense
EMF	Enlisted Master File
ERIS	Enlisted Recruiter Incentive System
ESR	Electronic Service Record
FTS	Full Time Support
FY	Fiscal Year
GSBPP	Graduate School of Business and Public Policy
HSDG	High School Diploma Graduate
LOC	Letter of Commendation
MAD	Mean Absolute Deviation
MCRC	Marine Corps Recruiting Command
MCRD	Marine Corps Recruiting Depot
MU	Musician
NAM	Navy and Marine Corps Achievement Medal
NAT	New Accession Training
NAVCRUITDIST	Navy Recruiting District
NAVCRUITREG	Navy Recruiting Regions
NC	Navy Commendation

NCES	National Center for Education Statistics
NCO	New Contract Objective
NDAWS	Navy Department Awards Web Service
NHSDG	Non-traditional High School Diploma Graduate
NRC	Navy Recruiting Command
NRD	Navy Recruiting District
NRF	Navy Reserve Force
NRS	Navy Recruiting Station
OLS	Ordinary Least Squares
OMF	Officer Master File
ORDPRO	Professional Review Board
PPR	Production-Per-Recruiter
PQS	Personnel Qualification Standards
PRIDE	Personalized Recruiting for Immediate and Delayed Enlistment
PSD	Personnel Support Department
QDP	Quarterly Demand Plan
RC	Reserve Component
RCAP	Recruiter Command Advancement Program
RCCPDS	Reserve Component Common Personnel Data System
REIP	Recruiter Excellence Incentive Program
RF 2020	Recruiting Force 2020 Strategy
RIS	Recruiter Incentive System
ROI	Return on Investment
R-OPS	Recruiting Operations Officer
ROY	Recruiter of the Year
RWSA	Recruiter Work Schedule Adjustment
SELRES	Navy Reserve Selected Reserve
Spec-ops	Special Operations
SWO	Surface Warfare Officer
TSC	Test Score Category
TTCU	Total Test Category Upper
U.S.	United States
USAREC	U.S. Army Recruiting Command
USN	U.S. Navy

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## **I. INTRODUCTION**

### **A. PURPOSE**

This thesis will evaluate the U.S. Navy's awards and incentives system and its effects on monthly recruit contract quality. The thesis will estimate the level of recruiter productivity, with respect to recruit quality, as determined by monthly goaling criteria. The objective is to determine if the current Navy Recruiting Command (CNRC) awards and incentive system has unintended consequences of causing reductions in recruit quality. Specifically, recruiters may sacrifice on the quality of recruits as the end of the month approaches to meet their monthly goaling deadline.

### **B. RESEARCH QUESTIONS**

Research Question 1: Do recruiters have lower quality recruits at the end of the month compared to the beginning of the month?

Research Question 2: Does recruit quality decrease during the three-month award eligibility window for a recruiter's first Gold Wreath award, and reduce even more in the last month of that three-month award window?

### **C. BACKGROUND/DISCUSSION**

The Department of Defense's (DoD) keen focus on the variation in recruiter productivity since the establishment of the All-Volunteer-Force (AVF) has driven a wide array of research analysis and studies on how to increase recruiter productivity while utilizing available resources effectively and efficiently. Over the last few decades, the population of high quality military-eligible youth has increased; however, during the same period, the propensity to serve has decreased amongst that population. The Navy recruiters' job is increasingly challenged by the availability of alternative civilian labor market options and by educational options for the targeted population of eligible youth.

Recruiter awards and incentives systems have been utilized through a wide array of programs to increase recruiter productivity throughout their recruiting tour that is usually three years in length. While previous programs, such as the Freeman Plan, and

Recruiter Excellence Incentive Program (REIP), were considered successful to some extent by some analysts (Asch, 1990), such programs often displayed some unexpected negative effects on recruiter behavior towards the end of a production cycle, particularly an increased number of lower quality recruit contracts. For this area of study, recruit quality is determined by a mix of factors, such as Armed Forces Qualification Test (AFQT) scores, and High School Diploma Graduate (HSDG) status.

The current Navy Recruiting Command Awards System gives recruiters the opportunity to earn awards and incentives on a quarterly and annual basis throughout the tour of recruiting duty. Recruiters are able to earn individual awards for productivity and for meeting or exceeding monthly goals. The recruiter has the opportunity for rewards that include, but are not limited to, immediate promotion under the Recruiter Command Advancement Program (RCAP), Navy Commendation medals, Navy Achievement medals, and time off during the production cycle for exceeding individual goals over a specified period as promulgated by the Navy Recruiting District (NRD) Commanding Officer's (CO) monthly goaling letter. Most time-off incentives vary across NRD, which is set by each CO dependent upon the goals of the districts and geographical areas they cover.

When goals are not met, recruiters are assessed and training is commonly recommended. NRD staff stated that no formal negative penalties have occurred for individual recruiters not making their goal.

This thesis attempts to determine if recruiters sign lower quality recruits at the end of the month compared to the beginning of the month. Also, this thesis assesses whether the current Navy Recruiter Awards System incentivizes recruiters to sacrifice recruit quality to earn awards, specifically at the end of the three-month award eligibility window. Recommendations are made to assist CNRC in making informed decisions about the effective and efficient management of recruiting resources.

#### **D. SCOPE OF THE THESIS**

The scope of the thesis includes (1) a review of the Navy recruiting command awards and incentive system, (2) an in-depth review of the Navy recruiting command's

goaling process to include fiscal year (FY)13 operational analysis and risk assessment, (3) a statistical analysis of monthly recruit contract quality for individual recruiters, and states, (4) an analysis of the effects of the awards system on monthly and quarterly recruit contract quality, and (5) a set of recommendations for an effective solution to further support NRC's FY13 Business Plan and Recruiting Force 2020 Strategy (RF 2020) (Commander Navy Recruiting Command, 2012a).

## **E. METHODOLOGY**

This research is primarily quantitative and uses the following methodology.

- Conduct a literature review analyzing previous work done in the area of recruiter productivity
- Analyze Personalized Recruiting for Immediate and Delayed Enlistment (PRIDE) Data (1997–2011) provided by CNRC.
- Visit NRD San Francisco to discuss with staff how the goaling, award and incentive programs are administered. Obtain information about the tangible and intangible effects of awards/incentives on recruiter behavior with respect to increased or decreased productivity on a monthly and quarterly basis. Also, have continuing discussions with recruiters about actions concerning achievement and non-achievement of recruiter goals.
- Engage CNRC and Region West staff in conversation with respect to the recruiter goaling process.
- Develop several multivariate models to help predict recruiter productivity based on the quality of recruit contracts during specific periods at the end of a month. The models will use explanatory variables based on individual demographics, geographical area covered (state), FY97–11), and state unemployment rates.
- Make recommendations on policies to increase recruiter productivity via the awards and incentives system.

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## **II CNRC AWARDS AND INCENTIVE SYSTEMS AND GOALING PROCESS**

### **A. CNRC RECRUITER AWARD AND INCENTIVE SYSTEM**

The Navy enlisted recruiter awards and incentive system gives enlisted recruiters the ability to earn individual awards and incentives based upon their monthly, quarterly, and annual production with respect to achieving their net new contract objective (NCO) and reserve attainment goals. The net NCO is derived from the difference between the number of contracts written and the number of actual recruit accessions and nets out Delayed Entry Program (DEP) attrition. The net NCOs and reserve attainment goals are disseminated from each Navy Recruiting Region to each NRD under their cognizance via a Monthly Goaling Letter. Recruiter award and incentive eligibility is based upon the beginning of the month goals. Mid-month goal adjustments do not adversely affect award and incentive eligibility; however, incentives may become more robust to help shape recruiter behavior to meet the changing mission. Monthly goals are set for each recruiter according to the NRD and Navy Recruiting Station (NRS) at which the recruiter is assigned.

A recruiter may earn a variety of awards for team and individual efforts. Individual productivity awards include the Gold Wreath award and the Six-Shooter award. The Admiral's Accelerator award utilizes the Recruiter Incentive System (RIS), which is a system that assigns points to recruits based on quality. Points are also assigned for the achievement of varying diversity goals (Black, female), special programs (Nukes, Special Warfare, Special Operations, Reserve, Active), and Total Test Category Upper (TTCU) (upper Mental Groups) (Commander Navy Recruiting Command, 2012a; Commander Navy Recruiting Command, n.d.).

As stated in the Navy Recruiting Command's "Recruiting Force 2020 Strategy" (Commander Navy Recruiting Command, 2012b), the mission of Navy recruiting is to "Recruit the best men and women for America's Navy to accomplish today's missions and meet tomorrow's challenges."

RF2020 places increased emphasis on three overarching goals.

- Increase organizational productivity and capacity to meet all missions
- Develop a very high quality workforce grounded in commitment and workplace satisfaction
- Measure success and return on investment (ROI) to balance against future recruiting risk

## **B. HISTORY OF CNRC AWARDS AND INCENTIVE SYSTEM**

CNRC has changed the awards and incentives system throughout the last few decades in an effort to increase recruiter productivity and promote recruit quality goal achievement. The latest awards and incentive system updates have placed a large emphasis on recruit quality in support of Navy Recruiting Command's RF 2020. A few of the challenges that recruiters face in achieving their goals are increased standards for military qualifications, shifting population demographics, recruiting diversity, and the focus on "fit vs. fill." The focus on "fit vs. fill" describes the shift to quality versus quantity in Navy recruitment.

A recruiter may earn only one of many awards for the same achievement, act, or period of meritorious service. The current system, as well as the previous one, allows recruiters to earn team and individual awards. This thesis focuses primarily on the attainment of individual awards by recruiters. In February 2012, the awards and incentives system was changed to base eligibility criteria on TTCU<sup>1</sup> quality contract attainment specifications (Commander Navy Recruiting Command, 2012a). This change signals a shift of focus to recruit quality versus recruit quantity in the recruiting world.

Under the current system, a Gold Wreath award is earned based on the net NCO and Reserve attainment goals disseminated in the NAVCRUITDIST's Monthly Goaling Letter. A recruiter may earn an unlimited number of Gold Wreath awards during their recruiting tour. The eligibility criteria for the Gold Wreath award states that enlisted programs recruiters are eligible for a Gold Wreath when they achieve any combination of four net new contracts/reserve gains (affiliations and/or enlistments) within a consecutive

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<sup>1</sup> Test Category Upper (TCU) now called Total Test Category Upper (TTCU) = (AFQT=>50); (TSC1-3).

(non-overlapping) three month period or less, or three net TTCU new contracts in a three-month, non-overlapping period (Commander Navy Recruiting Command, 2012a). The time period covered for any given Gold Wreath award cannot be used for any subsequent awards. No numerical requirement exists for recruit contracts achieved per month during any month in the three-month eligibility period as long as the overall quantity is attained.

The Admiral's Accelerator Award (AAA) is a quarterly program created to provide incentives for specific production requirements in areas, such as Recruiter Active Component (AC) or Reserve Component (RC), nuclear, and diversity to name a few. Military performance and conduct are also taken into consideration when COs determine candidate awardees. Under the AAA program, a RIS,<sup>2</sup> a point-based system, assigns points based on recruit quality type that may change from quarter-to-quarter depending on the recruit quality needs of the Navy. The top recruiter of each Navy Recruiting District (NAVCRUITDIST) who contracts the highest (net) number of TTCU contracts is eligible for the AC or RC version of AAA. Additionally, any recruiter who contracts a Prior Service Reserve or a Musician (MU) will be awarded two additional RIS points. Eligibility for the Nuke AAA requires top recruiters have the highest number of Nuke Female Nuclear Propulsion Officer Candidate (NUPOC) applicants (Surface Warfare Officer (SWO), Sub, Instructor or Engineer) sent to interview during the award period. Two of these awards are presented nationally, one for each of the two Navy Recruiting Regions (NAVCRUITREG). The Diversity AAA is awarded to recruiters who attain the highest total number of high quality African American and Hispanic applications ordered to the Professional Review Board (ORDPRO) during the award period. Four awards are presented nationally, two per NAVCRUITREG.

The RIS is the only point-based system authorized for use by the NRC. A description of the point system is presented in Appendix. For individual recruiters, RIS points are based primarily on the quality of the enlisted applicant during initial entry into DEP (affiliation), or for officers, the Officer Package submission and selection. Points are given for new contracts (NCO and Prior Service), TTCU, Special Operations (Spec-ops),

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<sup>2</sup> RIS formerly known as Enlisted Recruiter Incentive System (ERIS).

and Nuke to name a few. Additional RIS points are also received for accessions. Recruiter incentive points are promulgated quarterly on the AAA's notice dependent upon the needs of the Navy. The points are distributed as rate-specific to achieve "FIT" for the Navy.

Another award available for recruiters is the Commander Navy Reserve Force (CNRF) award. The CNRF award is presented to the top recruiter, whether AC or RC, in each NAVCRUITDIST who writes the highest number of net New Accession Training (NAT) contracts during the annual award period issued at the end of the FY. The NAT program was created for non-prior-service recruits to access into the Navy Reserve Selected Reserve (SELRES) primarily to supplement manning in an effort to reduce critical ratings shortfalls. NAT recruits would initially attend Recruit Training Command and continue to an A-school (rate-specific) and a C-school (rate-specific specialization training) if necessary prior to returning to their hometown. After successful completion of all required schooling and training, NAT recruits are then under the cognizance of the Navy Operational Support Center nearest their residence (Navy Recruiting Manual-Enlisted 1130.8J Vol. 4).

Enlisted mission recruiters who achieve a monthly net Production Per Recruiter (PPR) of 2.0 or greater for the FY are eligible to receive a Navy and Marine Corps Achievement Medal (NAM). Also, enlisted mission recruiters who achieve a net PPR of 4.0 or greater for the FY are eligible to receive a Navy Commendation (NC) medal. Each fiscal year, personnel will only receive the highest production medal (NC or NAM) earned with the exception of the CO's special achievement NAMs for production. The CO's special achievement NAMs for production include critical programs awards, such as the CNRF Award, and the Commander Navy Special Warfare Command (CNSWC) Award, which are not all inclusive. Time off from duty is also authorized for various levels of production, and is used to shape recruiter behavior with respect to monthly, quarterly, and annual recruit quality attainment goals.



The Six-Shooter Award, although not currently available to recruiters in the 2012 awards manual, was earned by an individual recruiter personally achieving six net new contracts during any given month. Recruiters who earned this award were given time off (Special Liberty), a six-shooter plaque, and recognition in the Navy Recruiting Command Magazine.

Commander Navy Recruiting Command authorized the Admiral's Five Star Award beginning on January 2006. Recruiters earned this award by personally achieving five net new contracts during any given month. After three consecutive months of earning the award, recruiters become eligible for a Flag Letter of Commendation (LOC) that translated into two points toward advancement exams for E-6 and below.

### **C. ANNUAL AWARDS**

The national AC and RC enlisted recruiters of the year, national enlisted diversity recruiter of the year,<sup>3</sup> and National NSW/NSO recruiter of the year is eligible for a NAVCRUITCOM NC. Strong consideration is given to recruiters whose efforts directly contribute toward achievement of the NRC's priority, diversity, and quality targets.

Prior to February 2012, to earn the Gold Wreath award, a recruiter was not required to achieve every monthly quality goal within the three-month award eligibility period as long as the recruiter obtained the required number of contracts within the three-month award window. Also, the right quality contract was desired but not required to win the award. Over time, the number of contracts required to earn an award has decreased due to the downsizing and right-shaping of the U.S. Navy. District or station leadership may prevent recruiters from writing, for example, five contracts in the third month just to receive an award if recruiters are not meeting their monthly goals during the first two months of that award eligibility period. The responsibility for monitoring and requiring that the recruiters write high quality contracts is held more importantly at the district and individual station leadership level. One of the main challenges faced by the leadership is ensuring that recruiters are focused on achieving high quality contracts instead of just

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<sup>3</sup> For purposes of Recruiter of the Year (ROY) consideration, "Diversity" includes African-American, Hispanic, Native American, Asian Pacific Islander, and female.

chasing the awards and incentives that can be achieved by writing low-quality contracts. The recruiting challenge increases in high-volume, low-quality markets when trying to meet monthly mission goals. The reality in the recruiting world is that more work is required when recruiting lower quality recruits due to their increased DEP attrition risk, probable academic shortcomings, and increased supervision requirements (Bruno, 2005). The increased workload is evident during mid-month recruit goal shifts when increases may occur in individual recruiters' contract goals.

Another highly sought after incentive is the RCAP promotion, which replaced the Recruiter Excellence Incentive Program (REIP) promotion in August 2007. The change was propelled by the large difference in advancement opportunities afforded to active recruiters opposed to reserve recruiters (primarily canvasser recruiters (CANRECs)). Under RCAP (COMNAVCRUITCOM INSTRUCTION 1430.7C), eligibility requirements to earn the promotion were simplified and the inequities between active and reserve Full Time Support (FTS) recruiters were mostly eliminated. The RCAP program is utilized to achieve production benchmarks, which include the Navy's accession and Test Category Upper (TCU) quality goals (now called Total Test Category Upper (TTCU)). Also, RCAP provides increased meritorious promotion opportunities using a "total person" concept to incentivize production in excess of 100% of recruiting goals.

Two types of RCAP awards may be earned, meritorious and production. The number of RCAP awards available to each NRD is calculated using the following formula.

- Meritorious RCAP Allowances: Meritorious advancement authorizations are based on the average annual active enlisted manning of each NRD. These advancements are equal to one per 50 enlisted personnel or fraction thereof. For example:  
$$\# \text{ of Meritorious RCAP} = \frac{\text{Average (AC) Enlisted Manning}}{\text{Advancements allowed 50}}$$
- Production RCAP Allowances. Additional RCAP authorizations can be earned by NRDs based on the following achievements.
  - (1) NRD's achieving 100% NSW/NSO<sup>4</sup> NCO:  $1\% \times [\text{NRD average annual enlisted manning}] = \text{additional RCAP Advancements}$ .

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<sup>4</sup> Navy Special Warfare/ Navy Special Operations (NSW/NSO) recruit career options.

- (2) NRDs that achieve two of the four following production criteria:  
 $1\% \times [\text{NRD average annual enlisted manning}] = \text{additional RCAP Advancements.}$
- Production criteria:
  - 100% Fiscal year (AC) Test Category Upper (TCU)<sup>5</sup>
  - 100% Fiscal year (RC) Test Category Upper (TCU)
  - 100% Fiscal year (AC) Accession
  - 100% Fiscal year (RC) Accession

For each calculated RCAP allowance/authorization, a fractional result is always rounded up to the next number. In any case, the total overall percentage of RCAP awards may not exceed 5% of the NRD's average annual enlisted manning.

According to OPNAVINST 1430.4, CNRC is only allowed to submit 26 RC candidates per RCAP cycle. An equitable distribution of the 26 RC allowances is handed down from CNRC to the Navy regions. Career Recruiting Force recruiters (AC and RC) are ineligible for the award. Individual recruiters compete for the RCAP awards based on the program eligibility criteria and supervisor evaluations. To become eligible, a recruiter must be Personnel Qualification Standards (PQS) qualified and have passed the recruiter board. All time-in-rate advancements requirements must also be met. Any person previously advanced under RCAP (or the previous REIP program) are ineligible for the advancement program. Recruiters must meet current health and physical readiness standards as set forth in the Navy's OPNAVINST 6110.1. Another condition is that recruiters must have passed the last advancement exam given in the FY in which they are nominated for advancement. With all Navy advancements, evaluation reports are considered. As shown above, the total person concept is in effect in determining which recruiter becomes eligible to earn immediate promotion under RCAP.

CNRC Awards Division and the NRD's only maintain recruiter-earned awards in a database for two years. The Navy Department Awards Web Service (NDAWS) database manager stated that community-specific awards (i.e., "Gold Wreath Recruiting awards) are not input into NDAWS. Community-specific awards are those awards earned

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<sup>5</sup> Test Category Upper (TCU) now called Total Test Category Upper (TTCU) = (AFQT=>50).

while serving in specific warfare or special duty assignments, such as recruiting. The awards are input into the service members' electronic service record (ESR) via scanned page 13 entry. Determining if the award was given specifically for production versus overall performance is definitely a challenge. The community-specific awards are processed by the individual NRDs and sent to the respective Personnel Support Departments (PSDs) to be entered into the service member's ESR. Also, NRDs only have access to ESRs for members who are currently at their command. Collecting recruiting community-specific award data for this thesis posed a challenge due to the many man-hours and manpower required to determine which recruiter earned what award from 1997 through 2011.

#### **D. CNRC GOALING PROCESS**

Chief of Naval Personnel (CNP) distributes the CNP goaling letter (trimester goals) to CNRC based upon the Quarterly Demand Plan (QDP). CNRC determines overall annual and monthly recruiting goals then sent to Region East and Region West to be appropriately apportioned out to each NRD under their cognizance. The Navy's goaling model is run once a year at CNRC to provide goal shares for each NRD aggregated out to each region for new contract shipping goals by month, rate, program, and gender. The goal distribution determination is based upon population demographics for the areas of responsibility for each region. Another factor considered is the historical success in recruiting and the state unemployment rates. The local unemployment rate is a huge driving factor, particularly long term, in the Navy recruiter's ability to recruit and meet their mission successfully. The role of local unemployment rates are discussed more in Chapter IV.

Currently, 26 NRDs are in existence. Thirteen are assigned to each region, respectively. Each NRD is comprised of nine divisions (formerly called zones) consisting of approximately four to five recruiting stations each. Currently, the recruiting stations number 1,418; however, this number may be reduced in the near future (CNRC staff provided current number of recruiting stations).

After receipt of the NRD goals, each NRD's CO distributes a monthly goaling letter that delineates the recruiting prospect priorities, an up-to-date status on district production, and CO monthly incentives. A few of the categories commonly mentioned on a goaling letter for recruiting priorities are AC, NCO, RC, prior service, New Accession Training (NAT), nuke, and female goals. New Contract Objectives (NCO) are the recruits who have no prior service. NAT are those active (drilling) reservists personnel who go through recruit training, attend a service school for their rate, and are then sent back to their drilling home state for reserve duty.

The Recruiting Operations Officer (R-OPS) begins the goaling distribution process at the NRD level. Then, the NRD's Chief Recruiter and Assistant Chief Recruiter creates station, and thus, individual recruiter goals based upon the market share of youth population. The goals are developed using recruiter electronic databases, such as WebSTEAM, and ASAD, for up-to-date information. WebSTEAM is a database utilized in the recruiting community to provide the following reports: Goal Matrix (goal and sub goals by station); Leads Zip Code Report; and Market Share (zip code level and production demographics). WebSTEAM enables recruiters to perform their jobs more efficiently (COMNAVCRUITCOMINST 1130.8J—Volume I-CH1). The quality and count of personnel in the DEP attribute to shaping the targeted goals.

The Navy uses a "Fit to Fill" ideology for recruit position seeking. The more desirable recruits are those who score 50 or above on their AFQT test and are also HSDG. Currently, CNRC requires a combined quality goal of 75% recruits who are HSDGs and who have AFQT scores of 50 or greater. Applicants who score less than 50 but 35 or above on their AFQT are qualified but not eligible unless a call for "open season" occurs, which is utilized to accommodate the needs of the Navy. These ineligible recruits are "banked," and held in suspense until "open season." The "open season" call by CNRC is dependent upon the Navy's end strength profile and what is needed to make capacity given resource constraints. The "open season" call, if given, normally coincides with a 75% mission gate, which is normally the end of the third week of the month. In recruiting, mission gates refer to the time of the month that particular missions (goals) need to be met, such as the 25%, 50%, 75%, and 100% gates. These percentages are

associated with monthly dates, for example the end of the first, second, third, and fourth weeks of the month, respectively. The exact dates may shift around the times of the month during which overall recruiter productivity is affected by operational or administrative commitments (i.e., federal holidays).

Throughout any given month or year, a possibility exists that the recruit quality requirement may be reduced to account for an increase in the required overall number of individual contracts. The monthly mission is always dependent upon the Navy's demand signal from CNRC and CNP with respect to recruit quality requirements. Month-to-month mission changes may occur that disrupt a recruiter's ability to recruit the right quality person required by mission. Recruiters are always challenged to attract the right people for the right job at the right time.

#### **E. SUMMARY**

CNRC utilizes a combination of various awards and incentives to motivate recruiter performance. The most notable individual recruiter awards authorized are the Gold Wreath Award, AAA, Navy achievement medals, LOC medals, Recruiter Command Advancement Program immediate advancement, and time off from duty. Time off from duty is authorized in conjunction with earning particular awards. However, time off is also available monthly dependent upon each NRD's criteria for eligibility as described in the CO's monthly goaling letters.

The monthly goals switch from month to month and may sometimes switch during the month based upon demand signals from CNRC and CNP. Also, in the recruiting community, the term "mission gates" is utilized. The mission gates are specific times (dates) during the month when specific goals are required to be met, such as required quality and quantity of certain contracts (i.e., male upper or female air). "Male upper" refers to males who score 50 and above on the AFQT test. A mission gate may require that by the 20th of the month, 100% of male upper contracts must be written. After the mission gate, leadership may declare an "open season" period during which the recruiters are allowed to write the lower contracts that they may have been "banking." The term "banking" refers to when a recruiter is not allowed to write a contract on willing

military-eligible applicants for one reason or another at the point of contact; however, these eligible recruits are told that they will be called upon at the next window of opportunity that the military is taking that type of recruit. An example of when a recruiter would bank an eligible recruit occurs when that person is a male lower (below 50 AFQT score) and the military has sufficient male lower inventory and requires only male uppers. That recruit is banked until the next window of opportunity for the recruiter to enlist male lower candidates.

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### **III. LITERATURE REVIEW**

#### **A. USMC END-OF-MONTH RECRUIT QUALITY STUDIES**

In the recruiting world, recruiters are under extreme pressure to meet monthly recruiting goals, particularly towards the end of a given month. If they have not obtained a high quality recruit, during any given month, recruiters may enlist lower quality recruits at the end of the month to meet the monthly goals established for their area of responsibility. The theses completed by Baczkowski (2006) and Bruno (2005) analyze and attempt to explain the effects of end of the month recruiting on the quality of new recruits as measured by DEP attrition and attrition at the Marine Corps Recruiting Depot (MCRD). Both studies control for observable factors that also affect attrition rates, such as age, gender, race, AFQT scores, and education.

##### **1. Baczkowski (2006)**

In this Naval Postgraduate School thesis, Baczkowski seeks to determine if any statistical evidence exists that Marine Corps recruits recruited at the end of any given month have higher attrition rates compared to those recruited earlier in the month.

Baczkowski hypothesizes that attrition may be higher for those recruits enlisted at the end of any given month, on average. Recruit DEP attrition and recruit training attrition was analyzed to determine if a statistical relationship occurs between recruits who sign contracts at the end of the month and their quality and attrition behavior. Baczkowski analyzes recruit attrition and quality based on whether they sign contracts during the last 10 days, the last week, and the last day of the month, respectively.

Baczkowski uses multivariate Logit regression models to regress attrition on demographic variables, such as age groups (<19, <22, <28, <36), gender, race (White, Black, Other, Declined), education level (Senior and HSDG), AFQT score (Mental Group=Test Score Category (TSC)), Component (AC and RC), and dummy variables representing the day of the month a recruit enlisted (last 10 days, last five days, and last day, respectively). The estimated coefficients of the independent variables were analyzed

for partial effects and the odds ratios. Three separate models were estimated with the only difference between the different models being that each contained only one indicator variable for the time of the month that a recruit signed a contract.

Baczkowski found no statistical evidence to support any significant relationship between MCRD basic training attrition and the day of the month a recruit enlists. For the other explanatory variables, he found that female recruits had an attrition rate at MCRD 5.5 percentage points above that of male recruits. Black recruits were found to attrite at a rate of .01 percentage points greater than whites and other races. Also, he found that AFQT score is an accurate predictor of basic training success, where each one point increase in AFQT score increased the likelihood of success by 3.5 percentage points.

## **2. Bruno (2005)**

Another Marine Corps Naval Postgraduate School thesis, which was completed by Bruno, analyzed Marine Corp Recruit DEP attrition rates. Bruno analyzed a multitude of variables to determine their effect on DEP attrition rates of Marine recruits. Bruno makes the connection of the end of the month deadline to meet the required monthly goals with the term “hockey stick effect,” which was a phrase coined by Lee (1997). The hockey stick effect occurs when a rush occurs to meet a “deadline-sensitive goal (Bruno, 2005).”

Bruno uses a probit model to analyze the effect of many factors on a Marine Corps recruit’s probability of attrition while in the DEP. Bruno analyzes the day of the month a recruit enlists for its effect on DEP attrition. The factors used to explain attrition included HSDG status and High School Senior status. Next, Bruno’s attrition model did not include variables for gender or race.

The explanatory variables included the time between when an individual took the Armed Services Vocational Aptitude Battery (ASVAB) test and when he actually enlisted (ASVABTIME), age, component (regular or reserve), AFQT score, and variables representing the first three weeks, as well as the last week, of the month (WEEK\_123, WEEK\_45) (Bruno, 2005). Bruno first tested each variable for its individual effect on DEP attrition rates and then included many interaction effects in an effort to determine

which combination of variable (factors) contributed to attrition risk. Next, he created groups of recruits with similar risk factors particularly for the timeframes during the first three weeks of the month compared to the last week of the month. Bruno used data for FY00/01 and FY03/04 data sets.

The grouping process enabled the author to conclude initially that each group did not exhibit a higher DEP discharge (attrition) probability when recruited during the last week of the month as compared to the first week of the month. Furthermore, Bruno created three categories using the information he attained from the grouping process: (1) enlistees who exhibited a low probability of discharge at all times, (2) enlistees who exhibited a high probability of discharge regardless of when they were enlisted, and (3) enlistees who exhibited a high probability of discharge only during the last week of the month (Bruno, 2005).

Bruno's analysis found that all the variables utilized in the regression models were statistically significant using the FY00/01 data (Bruno, 2006). He found that the average individual who enlisted during the first three weeks of the month exhibited a 17.3% probability of DEP attrition. A fourth week enlistee in that same model exhibited a 19.5% attrition probability, which is 2.2 percentage points higher than other enlistees. Most importantly, the individual who enlists during the last week of the month has a 21.3% probability of attrition, which is a 4.0-percentage point difference compared to those who enlisted during the first three weeks of the month. The results of the FY03/04 model analysis supported the findings of the FY00/01 model results. The results of the FY03/04 model showed that individuals enlisting during weeks one through three have a 19.2% attrition probability whereas those enlisting during the last week of the month have a 21.6% probability of discharge (2.4 percentage points higher). Most notable is that a recruit who enlists on the last day of the month has a 22.6% probability of attrition, which is 3.4 percentage points greater than a recruit who enlists during the first three weeks of the month.

The results of Bruno's analysis supported the theorized "end of the month rush" also known as the "Hockey stick effect" when individuals enlisting during the last week of the month have a greater likelihood of DEP attrition compared to those enlisting

during the first three weeks of the month. However, he noted that if enlistment criteria could identify high-risk recruits, attrition rates could be reduced before contracts are signed (Bruno, 2005).

## **B. USN ENLISTED RECRUITER GOAL SHARE AND GOAL-BASED RECRUITING STUDIES**

Hojnowski's (2005) Naval Postgraduate School thesis research explored the enlisted goal-shares process distributed by CNRC to the Navy regional recruiting commands. Hojnowski analyzed the factors included in the U.S. Navy's (USN) goaling model to determine their contribution towards the creation of goal-shares. Hojnowski found that CNRC's goaling forecasts were accurate in predicting actual numbers of new contracts obtained during past time periods, but that improvement was possible by adding new variables in the goaling model (Hojnowski, 2005).

In 1996, David Pry conducted thesis research to determine the validity of the allegations that the U.S. military services were inefficient and ineffective in the use of resources as stated in a prior Center for Navy Analysis (CNA) report. Pry's research sought to examine the goal-based recruiting process and its effect on the use of resources. Another goal of Pry's thesis was to attempt the explanation of the reduced (PPR and reduced mission accomplishment of the NRDs during the early 1990's.

CNRC requested that the CNA conduct a study on the effectiveness of recruiting models currently utilized to determine U.S. Navy enlisted and officer recruiting goals, and NRD goal shares. The goaling models do not consider the vast geographical coverage of each NRD; therefore, room for improvement is possible to determine more precise geographical allocation of recruiting resources, such as advertising and manpower (Pinelis, Schmitz, Miller, Rebhan, & Schmitz, 2011).

### **1. Hojnowski (2005)**

Hojnowski conducted interviews with key personnel in Navy recruiting who are knowledgeable and integral in the goaling process. Region West personnel were primarily called upon to discuss the goaling model and goal-share process. Most notable about this process is that CNRC distributes the goals to each region, East and West, who

then distribute the goal share to each NRD under their cognizance. The Navy Recruiting Districts Commanding Officers are under their own autonomy to ensure that the goals are distributed equitably to the enlisted recruiters in their NRD. NCO and accession goals are both assigned during this process.

Hojnowski also sought to evaluate the factors that affect the supply of enlisted personnel to the Navy. The controllable factors, although not all inclusive, affecting the Navy's ability to meet its recruit mission are DEP size, advertising, the number of available jobs for female recruits, desired quality mix, and bonuses. On the other hand, the population of eligible recruits, college entrance rates, and the veteran population are all uncontrollable factors that also affect the Navy's ability to achieve its recruit goals successfully. The focus on the right (desired) quality mix is prominent when HSDG and AFQT scores equal to and greater than 50 ( $AFQT \geq 50$ ) are considered high quality (Hojnowski, 2005).

The focus on enlisted recruiting, goal-share determination, and the factors impacting the Navy's ability to achieve its mission is analyzed for process accuracy and validity. Due to the consistent annual replacement of approximately 10% of the Navy's personnel end strength, the dynamic quality versus quantity determination is of great importance to the Navy.

The enlisted goaling and forecasting model in use only predicts the supply of net new male contract objectives for those who have no prior military service, who have attained a score of 50 or greater on the AFQT and achieved a high school diploma. The aforementioned group falls into the A-cell recruit group who are highly desirable and harder to attract than other eligible recruits. A-cell recruits statistically and historically exhibit lower first-term attrition, higher program qualification rates, lower training costs, and the best performance in their jobs. B-Cell recruits are the personnel who do not possess a traditional high school diploma, but have scored at or greater than 50 on their AFQT. These recruits have the aptitude required for service qualification; however, the lack of a high school diploma has statistically and historically been linked to a lack of commitment needed for service and the highest first-term attrition amongst all recruits.

The Cu-Cell recruits are those who are HSDCs yet only score between 35 and 49 on their AFQT. These recruits have lower attrition rates than the B-Cell recruits, but slightly higher attrition rates compared to A-cell recruits.

The goaling model is a tool used to determine recruiting district goals that consider past recruiting performance and the many factors that affect the ability to achieve the recruiting mission. For the goaling model, the dependent variable, as previously mentioned, was net new contracts of high quality males. The independent (explanatory) variables utilized were number of NRD production recruiters, eligible high quality (A-cell) male youth population, advertising dollars, enlistment bonuses, unemployment rates, military to civilian pay elasticity, eligible male HSDG TSC-IIIB (Cu-cell) population, veteran population, DEP size, retention, DoD recruiters, historical NCOs, and the quarterly seasonal (grouped months) effect. A fixed-effects autoregressive estimator is utilized for estimating the model that takes into account constant unknown differing variables across the recruiting districts, such as propensity to serve and patriotism. The primary explanatory variables of focus were eligible male high quality and low quality populations, number of recruiters, the unemployment rate, and relative earnings (military/civilian wage ratio).

Hojnowski sought to determine if the econometric goaling model in use by the Navy was valid or if room for improvement was possible. Also, this research evaluated whether the goaling model was a good predictor of the supply of higher quality A-Cell recruits. Last, but not least, his research compared the workforce recruit supply models with that of the high school senior supply models (Hojnowski, 2005).

Hojnowski found that even though the PPR has decreased over the years, the required number of contract and accession goals also has decreased (Hojnowski, 2005). While coupling the above scenario with the decrease in the eligible youth population's propensity to serve, recruiters must work even harder to attract those desired eligible personnel.

The ERIS, which is a point-based system, allowed recruiters to earn points based upon production. Under the old ERIS program, recruiter accumulated these points over

an annual production cycle. Due to the 36-month tour length of recruiters who normally check-in to their districts and station anytime during the year, the ability to compete for three cycles of awards was not feasible. A recruiter may at best compete for two cycles. Also noted was the ERIS programs' possible built-in mechanism to reduce recruiters' incentives to perform at a high level over the entire course of a production cycle. That behavior was thought to be attributed to either "stockpiling" recruits for the next cycle or working very little during the beginning or end of the production cycle to achieve the required contract goal. The ERIS program creates a contract-focused recruiter instead of one who focuses on both contracts and accessions, which contribute equally towards the Navy's overall mission. Nevertheless, ERIS and other award programs have been creatively utilized in an effort to shape recruiter behavior during recruiting tours.

Hojnowski's research found that demographic and economic factors and recruiting resources drive the supply of new contracts for the Navy (Hojnowski, 2005). The Navy recruiter's estimate results from the regression of the goaling model concludes that a Navy recruiter's effect on the predictive accuracy for net new contracts from the high quality male population is far more statistically significant as compared to other DoD recruiters. Also, demographics play a large role in the recruit goaling model. Relative military to civilian pay and unemployment rates also exhibited notably high statistical significance in the model. The goaling model was found to be a relatively accurate predictor of net new contracts of high quality contracts (Hojnowski, 2005).

Although the model was found to be accurate, areas of possible improvement were emphasized. The advertising variable, although of minimal statistical significance, would add increased value to the model if regional advertising expenditures could be included. The relative military to civilian pay variable also left room for improvement due to measurement error. The military pay, numerator, calculation is based on the average pay of E-1's and E-2's during the first two years of military service. The flaw introduced is the assumption that most recruits enter the service as E-1's and E-2's when actually, a large number of recruits enter the service as E-2's and E-3's. The variable calculation could be improved by utilizing E-1's through E-3's in the military pay calculation. Also, civilian pay is based on an average pay for 18–25 year-old whereas the

targeted population for initial service entry is 17–21 year olds. The discrepancy in the civilian wage for the targeted age group inflates the actual civilian pay alternative for the targeted eligible recruits.

CNRC calculates the estimated number of high quality male recruits needed to meet established requirements from the FY enlisted recruiting goals and policies, which ultimately provide national accession requirements and quality mix for CNRC. Goal share percentages are also generated for quite a few other categories of accessions and NCO. Nevertheless, goal share percentages for Females, African-Americans, Hispanics, Asian-Pacific Islanders (API), and prior service accessions also must be derived. This process relies heavily on historical demographic regional production data including projected recruiting resources. The assignment of targets for African-American, Hispanics, and API is performed to ensure that diversity within the Navy is a reflection of American population demographics (Hojnowski, 2005).

## **2. Pry (1996)**

Pry's research analyzes the effectiveness of U.S. Navy's goal-based recruiting system. The research includes an evaluation of the goal setting policy at that time (1990s), and how the recruiter incentive system contributed towards goal accomplishment. Furthermore, included in the research is a recommendation for establishing a bonus incentive-based system that rewards recruiters equitably for production in an effort to achieve higher recruiter productivity.

Pry discussed the structure of the NRC and NRDs that included goal planning and the types of recruiters assigned to each entity. A description of the types of awards and incentives authorized during the time of his study and prior years were discussed. The Gold Wreath award, a production award that an individual recruiter earns after achieving eight recruit contracts, was shown to be counterproductive in achieving the mission of the Navy in some cases. Pry hypothesized that as a result of no emphasis being placed on production in a single month for the Gold Wreath award eligibility criteria, a recruiter may be less inclined to work hard every month within that three-month time-period (Pry, 1996). This behavior has negative impacts on goal accomplishment. That impact is



especially felt when the last month of that award eligibility window falls in September, which is the last month of the FY when end strength requirements need to be met.

Pry stated that recruiters, by nature, sometimes exhibit risk-adverse behavior when the possibility of consistently overproducing may result in the assignment of increased future production goals (Pry, 1996). Pry utilizes a combination of interviews and discussions with key personnel including recruiters and staff assigned to CNRC to attain a better understanding of the goaling process. Pry seeks to analyze the hypothesis that overproduction does increase a district's future production goal assignment. Three tests of the hypothesis were conducted using regression analysis on each NRD's "goal-per-recruiter" as the dependent variable for a specific year utilizing the NRD's prior year goal accomplishment success rate as one of the explanatory variables. A similar regression was run with the exception that the prior two years goal accomplishment rate was utilized instead of only the prior year's rate. To acquire a better understanding of the process, Pry then determined CNRC average yearly mission per recruiter to calculate the variance in the total CNRC mission across FY90–95.

The first and second regression analyses of the hypothesis tests utilizing each districts "mission-per-recruiter" for a given year as the dependent variable utilizing the NRD's prior year success rates and two prior years' success rates, respectively, did not determine any statistically significant results to support the hypothesized relationship that increased recruiter productivity caused a future increase in assigned recruiter goals. The third regression's dependent variable was extrapolated by subtracting the average CNRC's mission (goal)-per-recruiter per year from the NRD's mission (goal)-per-recruiter per year. The explanatory variables, as previously stated, were the NRD's prior years' mission success rate. The hypothesis that overachievement by a district in a given year causes an increase in the assigned district's mission for the following year was supported by the third regression analysis results for each district (Pry, 1996).

During his research, Pry found that the goal-based system does promote skill variety, job identity, job significance, and feedback; however, it does not provide autonomy to the recruiter. As a result, recruiters are not given ownership of the process (Pry, 1996). As quoted by Pry in his research, Hackman and Oldman described job

identity as “when workers perceive the job as a whole and recognize all the steps in the process to produce an end product” (Pry, 1996). Hackman and Oldman also defined job significance as “when workers feel they are part of the process and their job has an impact on the end product” (Pry, 1996). Feedback was referred to as the closed-loop process when an employee’s performance is critiqued and the results of that feedback are tactfully and clearly provided to the employee (Pry, 1996). Pry did not have a formal method for measuring whether Navy recruiters have job identity and job significance. Nor did he have a formal method of measuring whether the recruiters (at the time of his study) received feedback. Nevertheless, Pry made assumptions that job identity and job significance did not exist for recruiters because “recruiters are not consulted with or encouraged to improve the goaling process” (Pry, 1996). Also, he noted that due to goals being dictated from higher levels of management, recruiters were only to achieve required production goals. Production recruiters do not provide input into the goaling process, and therefore, only perform to the set goaling mission. This process, Pry noted, does not leave room for recruiter expansion (growth) and surely does not promote increased mission accomplishment by the average recruiter (Pry, 1996).

As shown in the historical data, NRD mission assignment increased from one year to the next for 77.4% of all NRDs that overproduced in previous years. The evaluation of the goaling system during the time of the study determined that the method of mission assignment was ineffective as stated by Pry (Pry, 1996). Sixteen percent of the districts displayed statistically significant results with a 95% confidence interval based on a sample of five observations per NRD in FY90–95. None of the NRDs in the sample experienced a reduction in mission assignment following overproduction in the prior year. Pry’s explanation of this effect of NRD overproduction is due to the pressures in the recruiting world to produce at every level of mission assignment that then leads to increased mission assignment. As a result, the NRDs that are historically overachievers are expected to produce at higher level in future years (Pry, 1996).

The PRIME bonus incentive-based system was developed by the Naval Postgraduate School to provide an equitable recruiter reward program and better distribute recruiting resources (Pry, 1996). This system promotes recruiters’ ability to

provide input into the recruiting process by accurately forecasting their goals, which therefore contribute to improved future mission assignment. Also, PRIME disincentivizes recruiters to hold applicants for the following months and increases the recruiters' market potential success rate (Pry, 1996). Recruiters are increasingly rewarded with higher productivity based on this system. Due to the dynamic nature of mission requirements, CNRC is able to adjust the PRIME model to change recruiter behavior or productivity focus with respect to a given type of applicant to meet the ever-changing needs of the Navy (Pry, 1996).

### **3. CNA**

The last review of the enlisted goaling model was conducted in the late 1990s and did not incorporate all of the components affecting the recruiting market. CNA evaluated the enlisted and officer AC and RC goaling models and CNRC's incentive systems created to promote recruiting goal (mission) accomplishment. Also, this research assesses the perception of some recruiters that too much emphasis is placed on past production when other recruiting market components have a much greater effect on future production.

CNA stated that the goaling process should result in an equitable distribution of recruiting goals; thereby giving each recruiter an opportunity to succeed (Pinelis et al., 2011). However, due to an incomplete use of available market data and possible resource allocation inefficiencies, the goaling models exhibit limitations that affect recruiter productivity (Pinelis et al., 2011). The U.S. military utilizes a goal-share process to distribute enlisted recruiter goals to the recruiters. Due to the inherent design of that process, CNA hypothesized that the U.S. Navy experienced decreases in recruiter productivity and mission accomplishment in the early 1990s (Pinelis et al., 2011).

CNA sought to answer three questions.

- What is the most effective goaling level or unit of analysis?
- What market, demographic, and resource factors should be included in each model?
- What method should be used to allocate recruiting goals?

The goaling models incorporate factors, such as historical production, recruiting resources, economic and population factors, seasonality, and pay, among other factors (CNA 2011). The goaling forecasting model also considers factors, such as population demographics, state unemployment rates, and available recruiting resources to produce goal shares disseminated to each region and allocated to each NRD based on historical recruiting success and recruiting resources. This research highlights the primary recruit market as high school seniors and HSDGs between the ages of 17 to 22. This group is theoretically in their optimal training age range. Men in the 22 to 29 age group, regardless of having a high school diploma, are considered secondary market material.

The approach that CNA took began with Recruiter of the Year (ROY) interviews to determine what is missing from the current goaling process (Pinelis et al., 2011). The participants of the 2011 Officer Goaling Conference were also included in discussions. The review of Navy practices and modeling methods were conducted and compared to other services with respect to recruiting mission allocation. The data from other services were collected from the staff of the U.S. Army Recruiting Command (USAREC), Marine Corps Recruiting Command (MCRC), and the Air Force Recruiting Service (AFRS). After analyzing various databases in search of available factors that could enhance the current enlisted goaling models, CNA constructed an enlisted AC model. The databases utilized included the Enlisted Master File (EMF), Officer Master File (OMF), PRIDE, Reserve Component Common Personnel Data System (RCCPDS) and various market data resources (i.e., U.S. Census and National Center for Education Statistics (NCES)). Also, a recommendation was made for required data to enable the creation of similar goaling models for enlisted and officer RC and officer AC to improve the current goaling process (Pinelis et al., 2011).

CNA used a Zero-inflated Poisson model, which is a count model using Poisson distribution, to determine zip-code level goaling distribution for 2006 through 2010 recruiting years. Two stages were used during modeling due to the expected large number zero contracts for many of the zip codes (Pinelis et al., 2011). The first stage's (any-contracts model) purpose is to determine if the zip code will produce any contracts. The objective of the second stage (Counts model) is to determine how many contracts a zip

code will produce if determined to produce any contracts. The independent variables utilized in these models differed from those currently utilized in the Enlisted Goaling Model (Pinelis et al., 2011). Some of the variables included in the any-contracts model were distance to nearest college or university and their size, an interaction of the prior distance and size, and the existence of multiple colleges, as well as historically black colleges. The Counts model included variables, such as distance to the responsible NRS, demographic data, Navy Awareness Index, number of recruiters per zip code, crime data, and veteran population per county and age group.

The any-contracts model's results were consistent with the authors' hypothesis that the closer the distance to a college or university, the greater the number of colleges or universities in the area, and the larger the size of the schools were predictive of a lower probability of producing any contracts in a zip code. Demographics exhibited significant positive correlation with enlistment, specifically for 17–19 year-old Hispanics in their first three years of high school. Also, Navy advertising input was found to have the largest positive correlation to enlistment (Pinelis et al., 2011).

The predictive accuracy of the counts model was accomplished by calculating the average difference between the actual numbers of recruit contracts for each zip code (in 2010) with the model's prediction for that year by zip code. The absolute value of the average difference between predicted and actual contracts enabled the computation of the mean absolute deviation (MAD) that is 0.943. The model is only off by one recruit as represented by a MAD of one (0.943 rounded up to one) (Pinelis et al., 2011).

CNA concluded that the current goaling model's unit of analysis is the NRD that does not allow precise distribution of recruiting goals to maximize true market potential and needs. The enlisted AC model created and recommended by CNA forecasts the number of recruits goaled for each zip code that addresses the current goaling model's lack of geographical specificity. The use of zip codes allows the model to incorporate demographic (gender and race/ethnicity) and geographic recruiting focuses and resource allocation (Pinelis et al., 2011).

## **C. SUMMARY**

Goal shares are generated utilizing a forecasting and econometric goaling model that considers historical factors (population demographics, local economic conditions, and recruiting resources) used as predictors of future recruiting success. Navy recruiters are assigned their contract goals based upon results of the Navy's goaling forecasting model executed on an annual basis. Also, the U.S. Navy awards and incentives system provides the needed method geared towards increasing recruiter productivity in support of CNRC's overall goaling mission, specifically for net new contract attainments for the high quality male population. These studies exhibit the crucial link between enlisted recruiter goaling and the quality of recruits actually obtained by these recruiters during past time periods.

This thesis provides statistical recruit data and statistical analysis results that increases insight as to when Navy recruiters are not performing as expected when it comes to recruit quality, specifically for different times of the month. The results of this thesis can be used as a tool to assist CNRC in shaping recruiter behavior by providing feedback to recruiters and leadership alike. The results could also provide guidance for the adjustment to CNRC's awards and incentives system.

## **IV. DATA AND METHODOLOGY**

### **A. DATA COLLECTION**

The data utilized in this study were collected from CNRC's PRIDE database, which is updated on a real-time basis at CNRC. The period chosen for statistical analysis is the April 1997 through March 2011 timeframe, which captures recruit contract activity for all enlisted Navy recruiters. The original data files contained 768,508 observations of new recruits who signed contracts. Over the last few decades, CNRC has undergone restructuring from 31 to 26 NRDs. At the same time, some of the recruiting stations under each NRD's cognizance have shifted and been renumbered. The NRD numbers utilized for this study consider the previously mentioned territorial shifts due to the restructuring of CNRC. Data on state unemployment rates were taken from the U.S. Bureau of Labor Statistics government website for all U.S. states and territories (<http://www.bls.gov/lau/#tables.htm>).

### **B. SUMMARY OF SAMPLE AND VARIABLES**

Recruits whose age at enlistment was less than 17 and greater than 35 were dropped so that the remaining observations reflected the average age for the majority of enlistees. The final data set used for the analysis contained 759,087 observations.

#### **1. Dependent Variables**

Three types of binary dependent variables were created to represent low quality recruit contracts. Each of these alternative measures of low quality contracts were used in separate regression models. The three dependent variables captured low quality contracts based on three different definitions of quality: 1) contracts with a low AFQT score (less than 50%) or no traditional high school diploma, 2) contracts with only a low AFQT score, and 3) contracts without a traditional high school diploma.

#### **2. Independent (Explanatory) Variables**

The explanatory variables utilized in the multivariate regression models represented demographic factors, such as gender, race, marital status, and the age of

recruits at the time of enlistment. Enlistees were grouped into the following six race categories: Black, White, Asian, Native American, Hispanic, and Other. Dummy variables were created for states (excluding Wyoming), months (excluding January), and FY98–11. These dummy variables were included in the regressions to control for state, month, and year fixed effects. The average state-level unemployment rate for the 12 months leading up to the recruit’s enlistment date also was included in the multivariate regression models. The primary explanatory variables measured the time of month that the contract was written. The variables created indicated whether the contract was written near the end of the month and included binary variables representing contracts written in the last seven days, the last five days, the last three days, and the last day of the month. These time-indicator variables were included separately in each of the four low quality models to determine the effect of signing contracts near the end of the month on the quality of the contract. Variables were also created to indicate if the recruit contract was written within the recruiter’s first Gold Wreath award eligibility period. Furthermore, another variable was created to indicate if the time of the contract fell within the last month of the recruiter’s first Gold Wreath award eligibility period. Table 4.1 provides the definitions of the explanatory variables included in the low quality regression models.



Table 4.1. Variable Descriptions

Variable	Description
Age	Continuous variable, 17–35 years
Female	=1 if female; =0 otherwise
Married	=1 if married; =0 otherwise
White	=1 if White; =0 otherwise
Black	=1 if Black; =0 otherwise
Asian	=1 if Asian; =0 otherwise
Native American	=1 if Native American; =0 otherwise
Hispanic	=1 if Hispanic; =0 otherwise
Other Race	=1 if not included in above ethnicities; =0 otherwise
_Istate_1- _Istate_56	=1 if enlistment state; =0 otherwise
Month 1–12	=1 if enlistment month (Jan.–Dec.); =0 otherwise
FY97–FY11	=1 if Fiscal Year 1997–2011, respectively; =0 otherwise
Unemployment rate 12	Continuous variable; average state unemployment rate 12 months prior to recruit contract date
Low AFQT score or no High School Diploma	=1 if AFQT score<50 or NHSDG; =0 otherwise
Low AFQT score	=1 if AFQT score<50; =0 otherwise
No High School Diploma	=1 if NHSDG; =0 otherwise
Last 7	=1 if contract written in the last 7 days of month; =0 otherwise
Last 5	=1 if contract written in the last 5 days of month; =0 otherwise
Last 3	=1 if contract written in the last 3 days of month; =0 otherwise
Last day	=1 if contract written the last day of month; =0 otherwise
gold	=1 if within 1st Gold Wreath eligibility time-period; =0 otherwise
gold3	=1 if last month of 1st Gold Wreath eligibility time-period; =0 otherwise

All variables created by Author utilizing PRIDE database

\*Note 1: NHSDG= Non-traditional High School Diploma Graduate

## C. DESCRIPTIVE STATISTICS

Table 4.2 provides summary statistics for the analysis variables.

Table 4.2. Variables Summary Statistics

Variable	Mean	SD
Age	20	3.082
Female	0.203	0.403
Male	0.796	0.403
Married	0.023	0.150
White	0.410	0.492
Black	0.094	0.292
Asian	0.021	0.142
Native American	0.028	0.164
Hispanic	0.195	0.396
Other Race	0.448	0.497
Average Unemployment Rate 12 months prior to contract date	5.469	1.783
Low AFQT score or no High School Diploma	0.320	0.466
Low AFQT score	0.299	0.458
No High School Diploma	0.021	0.144
Last 7 days	0.310	0.462
Last 5 days	0.271	0.444
Last 3 days	0.182	0.386
Last day	0.097	0.296
Contract falling within 1st Gold Wreath eligibility period	0.083	0.277
Contract falling within last month of 1st Gold Wreath eligibility period	0.035	0.183

Created by Author

### 1. Low Quality Recruit Indicators

Recruits who had a low AFQT score or no traditional high school diploma represented 32% of the sample while recruits with low AFQT scores only and recruits with no high school diploma represented approximately 30% and 2.1% of the sample, respectively. The mean value for the low quality recruit who either has a low AFQT test

score only or no traditional high school diploma inclusively represents the mean values of the remaining two low quality types in this sample. Based on prior studies, recruits who score 50 or greater on the AFQT but do not possess a traditional high school diploma have an increased risk of attrition during their first term of service (Bruno, 2005). While recruit quality is a predictor of attrition rates, it seems likely that a recruit who is lower quality would cause a recruiter to think twice before rushing to sign a contract, particularly just to earn an award.

## **2. Age**

The average age of recruits in the sample was 20 years old. Of those recruits, 68% were between the ages of 17 to 19 and 32% were between the ages of 20 and 35. Due to most recruits enlisting after high school graduation, the sample age group percentages reflects historical demographic data.

## **3. Gender**

Males comprised 79.6% of the sample while females represented 20.4% of the sample. Males have been historically represented more than females in the U.S. Navy, which accounts for the comparatively high number of male recruits.

## **4. Marital Status**

Non-married recruits composed 97.8% of the sample while married recruits accounted for only 2.2% of the sample. However, seemingly a good predictor of recruit quality, marital status continues to affect recruit quality.

## **5. Race**

Whites accounted for approximately 40% of the sample whereas Blacks, Asians, Native Americans, Hispanics, and Others accounted for 9.4%, 2.1%, 2.7%, 20%, and 45%, respectively. The total race percentage exceeds 100% due to some recruits associating themselves with more than one race.

## **6. State Unemployment Rate**

A state's unemployment rate has been hypothesized to be a factor in an individual's decision to enlist in the U.S. Navy and other military services. The state's unemployment rate average for the 12 months leading up to the recruit's contract date is 5.5% for this sample.

## **7. End-of-Month Day Indicators**

Contracts falling within the last seven days of a given month comprised 31% of the sample recruit contracts signed within the last five days, last three days, and the last day of the month composed approximately 27%, 18.2%, and 9.7%, respectively, of the sample. The decreasing number of recruit contracts signed as the last day of the month approaches reflects the push by recruiters to meet contract goals before the last day of any given month.

## **8. Recruit Contract Date Within 1st Gold Wreath Award Eligibility Period**

Contracts that fell within the recruiter's first Gold Wreath award eligibility period comprised 8.3% of the sample. Of those contracts that fell within the Gold Wreath award period, and that also fell within the last month of the recruiter's first Gold Wreath award eligibility period, comprised 3.5% of the overall sample.

## **D. METHODOLOGY**

Ordinary Least Squares (OLS) regression models were specified to estimate the effect of end-of-the month indicators on recruit quality, controlling for FY, state, and month fixed effects. Regression models were created for each end-of-month indicator—the last seven days, last five days, last three days, and last day, respectively. Separate OLS regression models were estimated to determine the effect on recruit quality by using indicator variables representing if a recruit contract date fell within the individual recruiters first Gold Wreath award eligibility period and, if so, if the contract date fell within the last month of the recruiter's 1st Gold Wreath award eligibility period. The Gold Wreath award eligibility period is utilized in the regression models due to the

consistent authorization of the Gold Wreath award in the CNRC awards system over the previous decades.

State and fiscal year dummy variables, average state-level unemployment rates for the 12 months leading up to the enlistment, and demographic factors including age, race (Black, Native American, Asian, Hispanic and Other Race), and female are used in each OLS regression model.

The regression results provide estimates of the marginal effect on recruit quality for each of the variables utilized in the regression. The estimated coefficients, if statistically significant, represent the effect of a one-unit change in the explanatory variable on the percentage point change in the probability that the contract will be low quality.

Fixed effects regression models that control for recruiters' ability over time would have been the preferred statistical analysis method. However, due to maximum capacity limitations of the statistical analysis database and rather large number of recruiters (over 20,000), recruiter fixed effects were not estimated.

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## **V. MODEL ESTIMATION**

### **A. MODELS**

In an effort to determine if recruits who enlisted at the end of the month were lower quality than recruits who enlisted earlier in the month, the low quality binary variables representing low quality enlistees (those recruits who have either a low AFQT score (less than 50) or no traditional high school diploma, those who have a low AFQT score, and those recruits not having a traditional high school diploma, respectively) were each regressed on various factors statistically found in prior studies to predict recruit quality. Descriptions of Low Quality multivariate models are listed in Table 5.1. Eighteen versions of the multivariate OLS regression models based on each of the three outcomes are specified to estimate the effect of the explanatory variables on each of the recruit quality types. OLS models 1–4 estimate the probability of a contract being low quality based on the recruit having either a low AFQT score or no high school diploma. OLS models 1–4 have the same specification with the exception that the end-of-the-month day indicators change from the last five days, the last three days, and the last day of the month. OLS models 5–8 estimate the probability of a contract being low quality based on having a low AFQT score only. OLS models 5–8 have the same specification for each of the separate end-of-the-month indicators.

OLS models 9–12 estimate the probability of a contract being low quality based on the recruit having no high school diploma. OLS models 9–12 have the same specification with the exception of the use of the different end-of-the-month indicators. OLS models 13–14 also estimate the probability of a contract being low quality based on the recruit having either a low AFQT score or no high school diploma. These models have the same specification as models 1–4 with the exception of an indicator variable representing whether the recruit’s enlistment date falls within the recruiter’s first Gold Wreath award eligibility period and, if so, an indicator representing if a recruit contract date fell within the last month of the 1st Gold Wreath eligibility period, respectively. No end-of-the-month day indicators are used in these models. OLS models 15–16 estimate the probability of a contract being low quality based solely on a low AFQT score. These

model specifications are the same as models 13–14. Finally, models 17–18 estimate the probability of a contract being low quality based on the recruit having no high school diploma only. These models also utilize the same specifications as models 15–16. All of the models are estimated as linear probability models (LPM). To control for various fixed effects, the LPM models also include state, month, and fiscal year dummy variables. Low quality contract production may vary systematically by state or by month of the year or by year. Fixed effects models control for these systematic, but unobserved variations.

Table 5.1 Description of Low Quality Models

Quality Indicator	Model Number	End-of-the-Month Indicator
Low AFQT score or no High School Diploma	1	Last 7 days
	2	Last 5 days
	3	Last 3 days
	4	Last day
Low AFQT score	5	Last 7 days
	6	Last 5 days
	7	Last 3 days
	8	Last day
No High School Diploma	9	Last 7 days
	10	Last 5 days
	11	Last 3 days
	12	Last day
		Gold Wreath Award Eligibility time-period
Low AFQT score or no High School Diploma	13	Recruit contract falling within 1st Gold Wreath eligibility period
	14	Recruit contract falling within last month of 1st Gold Wreath eligibility period



Quality Indicator	Model Number	End-of-the-Month Indicator
Low AFQT score	15	Recruit contract falling within 1st Gold Wreath eligibility period
	16	Recruit contract falling within last month of 1st Gold Wreath eligibility period
No High School Diploma	17	Recruit contract falling within 1st Gold Wreath eligibility period
	18	Recruit contract falling within last month of 1st Gold Wreath eligibility period

## B. MODEL SPECIFICATION

The OLS Model is the following:

$$Y_{istm} = X_{istm}\beta + UR_{stm}\gamma + \sum \delta_s S_s + \sum \alpha_t T_t + \sum \lambda_m M_m + \epsilon_{istm}$$

where:

–  $Y_{istm}$  is one of the three low quality indicator types for recruit  $i$  from state  $s$  with enlistment year  $t$  and enlistment month  $m$

–  $X_{istm}$  represents the set of demographic factors, end-of-the-month indicators, and indicator variables representing whether the contract date fell within the recruiter's 1st Gold Wreath award eligibility period and, if so, an indicator variable representing if a contract date fell within the last month of that three-month time-period (see Chapter IV).

–  $UR_{stm}$  represents average unemployment rate 12 months prior to the enlistment date

–  $S_s$  represents indicator variables for state

–  $T_t$  represents indicator variables for year

–  $M_m$  represents indicator variables for month

–  $\epsilon_{istm}$  is the error term

As in fixed effects models, controlling for state, year and month enabled the estimates to represent the effects of within-state changes in end-of-the-month indicators on the within-state changes on the quality of the recruits enlisting (Arkes & Mehay, 2013). The same outcome holds true for the effects of recruit contracts being written during a recruiter's 1st Gold Wreath award eligibility period and also contracts falling within the last month of that 1st Gold Wreath award eligibility period (Arkes & Mehay, 2013).

### **C. HYPOTHESIS, REFERENCE GROUP, AND EXPLANATORY VARIABLES RELATIONSHIP/INTERPRETATION**

#### **1. Hypothesis**

The hypothesis of this study is the following.

- $H_0$ : Recruits enlisting towards the end of the month are of the same quality as those enlisting at the beginning of the month.
- $H_1$ : Recruiters sacrifice recruit quality at the end of the month to earn the awards, which result in a statistically different effect on recruit quality. Also, if so, recruit quality is even less during the last month of the 1st Gold Wreath award eligibility time period.

#### **2. Hypothesized Relationship of Effect of Explanatory Variables**

##### ***a. Age***

The average age of a recruit in this sample is 20 years old. Based on the prior literature, the hypothesized relationship between age and recruit quality is that recruits who are older at the time of enlistment will tend to have a higher likelihood of being higher quality.

##### ***b. Gender***

Males have historically scored higher on the AFQT tests, so it is expected that they would comprise the least amount of low quality recruits compared to female recruits. Females; however, historically have a higher graduation rate compared to males.

**c.      *Marital Status***

A recruit who is married may be more motivated to score well on the AFQT test, which consequently places them in the high quality category, assuming they have attained a traditional high school diploma. Thus, recruits who are married are expected to have higher probabilities of being high quality recruits.

**d.      *Race***

White recruits have historically scored higher on the AFQT test, with Asians following close behind. Black and Hispanic individuals lag behind on AFQT test scores even though their scores on average have increased through the years. Black and Hispanic recruits are expected to have a higher probability of being low quality recruits.

**e.      *Year***

The author hypothesizes that socio-economic and political issues and events over time affect the quality and quantity of the military-eligible youth population. Fluctuations in the youth population are reflected in the quality of new recruit contracts.

**f.      *Unemployment Rate***

The average of the unemployment rate for the 12 months leading up to an individual's enlistment are hypothesized to have inversely proportional effects on the number of individuals enlisting, which leads to an increased or decreased taste towards military service. This trend accounts for the overall increase or decrease in recruit quality. Also, during times of low state-level unemployment rates, the recruiting force faces increased challenges to attract the high quality recruits from the military-eligible youth population.

**g.      *End-of-Month Day Indicator***

As hypothesized in section C 1. b., recruiters may rush to make goal at the end of the month and may sacrifice recruit quality to meet their goal.

***h. Recruit Contract Date in 1st Gold Wreath Award Eligibility Time Period***

As previously mentioned, the sacrifice of recruit quality by recruiters may be more apparent during the 1st Gold Wreath award eligibility time period and even greater during that last month of that time period. Recruiters' eligibility for the 1st Gold Wreath award begins after an individual recruiter has been attached to a NRS for at least 90 days. Recruiters are trying to make a name for themselves at the NRDs by earning awards, and therefore, may be more willing to take lesser quality recruits to make monthly contract goals.

**3. Results**

Table 5.2 below displays the regression results for each low quality type outcome using the last seven days end-of-month indicator variable. State dummy variables were also included in the regressions but are not displayed in Table 5.2.

Table 5.2 OLS Regression Models of Probability of Recruit Being Low Quality

VARIABLES	(Last 7) Low AFQT score or no High School Diploma		(Last 7) Low AFQT score		(Last 7) No High School Diploma	
	coefficient estimates	standard error	coefficient estimates	standard error	coefficient estimates	standard error
Last 7 days	0.044***	(0.001)	0.035***	(0.001)	0.009***	(0.000)
Age	-0.010***	(0.000)	-0.010***	(0.000)	0.000**	(0.000)
Female	-0.009***	(0.001)	0.006***	(0.001)	-0.016***	(0.000)
Married	0.015***	(0.004)	0.010***	(0.004)	0.004***	(0.001)
Asian	0.048***	(0.004)	0.062***	(0.004)	-0.014***	(0.001)
Native American	-0.071***	(0.003)	-0.081***	(0.003)	0.010***	(0.001)
Black	0.238***	(0.002)	0.255***	(0.002)	-0.016***	(0.001)
Hispanic	0.053***	(0.001)	0.053***	(0.001)	0.000	(0.000)
Other Race	-0.147***	(0.002)	-0.148***	(0.002)	0.001**	(0.001)
February	0.008***	(0.003)	0.007***	(0.002)	-0.002**	(0.001)
March	-0.004	(0.002)	-0.002	(0.002)	-0.005***	(0.001)
April	-0.015***	(0.003)	-0.011***	(0.002)	-0.007***	(0.001)
May	-0.005**	(0.003)	-0.001	(0.003)	-0.007***	(0.001)
June	-0.010***	(0.002)	-0.002	(0.002)	-0.011***	(0.001)
July	0.001	(0.002)	0.009***	(0.002)	-0.011***	(0.001)
August	0.001	(0.002)	0.007***	(0.002)	-0.009***	(0.001)
September	0.006**	(0.003)	0.007***	(0.002)	-0.004***	(0.001)
October	-0.002	(0.003)	0.001	(0.002)	-0.006***	(0.001)
November	-0.008***	(0.003)	-0.008***	(0.003)	-0.003***	(0.001)
December	0.004	(0.003)	0.000	(0.003)	0.004***	(0.001)
Fiscal Year 1998	0.052***	(0.004)	0.052***	(0.004)	0.007***	(0.001)
Fiscal Year 1999	0.064***	(0.004)	0.040***	(0.004)	0.024***	(0.001)
Fiscal Year 2000	0.065***	(0.004)	0.041***	(0.004)	0.023***	(0.001)
Fiscal Year 2001	0.064***	(0.004)	0.042***	(0.004)	0.022***	(0.001)
Fiscal Year 2002	0.059***	(0.004)	0.052***	(0.004)	0.006***	(0.001)
Fiscal Year 2003	0.137***	(0.004)	0.130***	(0.004)	0.006***	(0.001)
Fiscal Year 2004	0.163***	(0.004)	0.170***	(0.004)	-0.008***	(0.001)
Fiscal Year 2005	0.134***	(0.004)	0.140***	(0.004)	-0.006***	(0.001)
Fiscal Year 2006	0.123***	(0.004)	0.133***	(0.004)	-0.011***	(0.001)
Fiscal Year 2007	0.134***	(0.004)	0.135***	(0.004)	-0.001	(0.001)
Fiscal Year 2008	0.123***	(0.004)	0.135***	(0.004)	-0.012***	(0.001)
Fiscal Year 2009	0.092***	(0.004)	0.104***	(0.004)	-0.013***	(0.001)
Fiscal Year 2010	0.034***	(0.005)	0.042***	(0.005)	-0.009***	(0.002)
Fiscal Year 2011	0.021***	(0.006)	0.032***	(0.006)	-0.013***	(0.002)
Average Unemployment rate for 12 months prior	-0.012***	(0.001)	-0.010***	(0.001)	-0.002***	(0.000)
Constant	0.497***	(0.012)	0.471***	(0.012)	0.026***	(0.004)
Observations	741,677		741,677		741,677	
R-squared	0.074		0.072		0.015	

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

\*Note State fixed effects were also included

The results in columns 1–2 show that recruits whose contract date occurred during the last seven days of any given month (as compared to recruits who sign during the first 23 days of the month) had a 4.4-percentage-points higher probability of being low quality (based on having either a low AFQT score or no high school diploma). This result was strongly statistically significant at the 1% significance level.

The results in columns 3–4 indicate that a recruit whose contract date occurred during the last seven days of any given month had a 3.5-percentage-point higher probability of being low quality based on having a low AFQT score only. This result was also strongly statistically significant at the 1% significance level.

The results in columns 5–6 indicate that recruits whose contract was written during the last seven days of the month had a 0.9-percentage-points higher probability of being low quality based on not having a high school diploma. These recruits were less likely to be low quality during the last seven days of the month as compared to the recruits who were of low quality based on having a low AFQT score that enlisted during the same time-period. That estimate is also strongly statistically significant at the 1% significance level.

Table 5.2 also shows that a recruit who is between the ages of 17 and 21 has a 1-percentage-point lower probability of being low quality (based on having either a low AFQT score or no high school diploma). The same results hold true for recruits of the 17–21 age groups to be low quality based on having only a low AFQT score. The results for the first two quality measures are strongly statistically significant at the 1% significance level. The result of the third quality measure is moderately statistically significant at the 5% significance level.

Females recruited during the last seven days of the month exhibit a 0.09-percentage-point lower probability of being low quality (based on having a low AFQT score or no high school diploma) as compared to males. The results were strongly significant at the 1% significance level. Female recruits exhibited a 0.06-percentage point lower probability of being low quality (based on a low AFQT score only) compared to

males. Most notable was the 1.6-percentage point lower probability for a female to be low quality (based on not having a high school diploma).

Married recruits who enlisted during the last seven days of the month have a 1.5 and 1 percentage-point higher probability of being low quality (based on having either a low AFQT score or no high school diploma and also (based on for having only a low AFQT score). Also, these married recruits face a 0.04-percentage-point higher probability of being low quality (based on not having a high school diploma). These results were strongly statistically significant at the 1% significance level.

Asian recruits exhibited a 4.8 and 6.2-percentage-point lower probability of being low quality based on the first two measures of low quality. However, based on the third measure of low quality, Asians whose contract date fell within the last seven days of the month experience a 1.4-percentage-point lower probability of being low quality. These results were strongly statistically significant at the 1% significance level.

Native Americans recruits exhibit a 7.1 and 8.1-percentage-point lower probability of being low quality when enlisting during the last seven days of the month based on the first two measures of low quality. However, based on the third indicator of low quality, Native American recruits enlisting during the last seven days of the month have a 1-percentage-point higher probability of being low quality. These results were strongly significant at the 1% significance level.

Black recruits exhibited a 23.8 and 25.5-percentage-point higher probability of being low quality if recruited during the last seven days of the month based on the first two measures of low quality. However, Black recruits whose contract date fell within the last seven days of the month had only a 1.6-percentage-point lower probability of being low quality (due to not having a high school diploma) as compared to white male recruits. These results were also strongly statistically significant at the 1% significance level.

Hispanic recruits exhibited a 5.3-percentage-point higher probability of being low quality if recruited during the last seven days of the month using the first two measures of low quality. However, based on the third indicator of low quality, Hispanic recruits whose contract dates fell within the last seven days of the month did not have a higher

probability of being low quality. These results were strongly statistically significant at the 1% significance level.

Recruits of other races exhibited a 1.5-percentage-point lower probability of being low quality based on the first two measures of low quality. However, recruits of other races had only a 0.01-percentage-point higher probability of being low quality based on not having a high school diploma. The results for the first two measures were strongly statistically significant at the 1% significance level. However, the result for the third quality measure was significant only at the 5% significance level.

The results for the month indicators showed that recruits who enlisted during the months of April, June, and July had about a 1-percentage-point lower probability of being low quality as compared to recruits enlisting in January. These results were strongly statistically significant at the 1% significance level. Of those three months mentioned, April exhibited the lowest probability of being low quality for all three low quality indicators.

Fiscal Years 1998 thru 2002 had higher probabilities of low quality recruits enlisting compared to 1997, whereas 2003 thru 2011 exhibited a lower probability of low quality recruits enlisting on average. These results were also strongly statistically significant at the 1% significance level.

The state-level unemployment rate 12 months prior to enlistment decreased the probability of a recruit being low quality. This result supports prior analysis of the inverse effect of state unemployment rates on successful military recruiting. The estimate showed that a 1-point increase in the average unemployment rate 12 months prior to a recruit's enlistment reduces the probability of being low quality (using the first measure of quality) by 1-percentage-point. The same results held true for recruits to be low quality based solely on a low AFQT score. A 1-point increase in the average state unemployment rate only caused a 0.02-percentage-point decrease in the probability of a recruit being low quality based on not having a high school diploma. Historically, the number of recruits enlisting increases when state unemployment rates rise causing an overall greater influx of both low and high quality recruits.



Table 5.3 OLS Regression Models of Probability of Recruits Being Low Quality

	<b>Low AFQT score or no High School Diploma</b>		<b>Low AFQT score</b>		<b>No High School Diploma</b>	
	<b>coefficient estimates</b>	<b>standard error</b>	<b>coefficient estimates</b>	<b>standard error</b>	<b>coefficient estimates</b>	<b>standard error</b>
Last 7 days	0.044***	(0.001)	0.035***	(0.001)	0.009***	(0.000)
Last 5 days	0.049***	(0.001)	0.040***	(0.001)	0.010***	(0.000)
Last 3 days	0.051***	(0.001)	0.040***	(0.001)	0.011***	(0.000)
Last day	0.057***	(0.002)	0.045***	(0.002)	0.012***	(0.001)

(Standard errors in parentheses) Created by Author

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5.3 displays the regression results for all four of the end-of-month indicators. To save space only the coefficients of the end-of-month variables are displayed in Table 5.3. The results exhibit the same higher probability of a recruiter enlisting a low quality recruit as the end-of-the-month approaches, regardless of which specific end-of-month indicator is used in the model. The probability that a recruit is low quality increases by 4.9, 5.1, and 5.7 percentage-points if recruited during the last five days, last three days, and last day of the month, respectively. The estimated results for these end-of-the-month indicators are all strongly statistically significant at the 1% significance level.

Also, recruits whose contract date occurred during the last seven days of any given month exhibited the same trend of having a higher probability of being low quality based on a low AFQT score. The percentage-point increases are 3.5, 4.0, 4.0, and 4.5 for last seven days, last five days, last three days, and last day, respectively. These results were all strongly statistically significant at the 1% significance level.

Based on not having a high school diploma, recruits whose contract dates fell within the last seven days, last five days, last three days, and on the last day are estimated to have 0.09, 1.0, 1.1, and a 1.2-percentage-point higher probability of being low quality. These results were strongly statistically significant at the 1% significance level.

Table 5.4 OLS Models Results for Indicators Representing the Effect on Low Quality Types for Recruit Contract Dates Falling Within the Recruiter's 1st Gold Wreath Award Eligibility Time Period

	Low AFQT score or no High School Diploma		Low AFQT score		No High School Diploma	
	coefficient estimates	standard error	coefficient estimates	standard error	coefficient estimates	standard error
Recruit contract falling within 1st Gold Wreath eligibility time-period	-0.001	(0.002)	-0.001	(0.002)	0.000	(0.001)
Recruit contract falling within last month of 1st Gold Wreath eligibility time-period	0.001	(0.003)	0.001	(0.003)	0.000	(0.001)

(Standard errors in parentheses)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 5.4 exhibits the regression results for the indicator variables representing if a recruit contract was written during a recruiter's first Gold Wreath award eligibility period. One model includes an indicator representing if the enlistment date fell within that three-month award eligibility period. The next model includes an indicator representing if the enlistment date fell within the last month of that three-month award eligibility period. The results for a recruit whose contract date fell within the recruiter's first Gold Wreath award eligibility period were not statistically significant for any of the three measures of low quality contracts. The results for the indicator variable representing those recruits whose contract dates fell within the last month of the recruiter's first Gold Wreath award eligibility period also were not statistically significant at predicting whether a recruit would be of low quality.

## **VI. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

### **A. SUMMARY**

U.S. Navy recruiters face many challenges that affect their ability to recruit high quality recruits and may at times sacrifice recruit quality at the end of any given month to earn awards. The regression results in this thesis supported the hypothesis that as the end of the month approaches, recruits have a higher probability of being low quality. The last day of any given month showed the highest likelihood of a recruit being low quality as compared to the earlier days in the month.

The gold and gold3 indicator variables effects were not statistically significant which does not validate the hypothesis that recruits enlisting during a recruiter's first Gold Wreath eligibility time-period have a higher probability of being low quality as compared to those same recruits enlisting after that time-period.

The three low quality type regression estimate results for Black recruits exhibited the largest effect on recruit quality. Black recruits exhibited a 23.8 and 25.5 percentage-point higher probability of being low quality based on the main two indicators of being low quality (having either a low AFQT score or no high school diploma and also for only having a low AFQT score) as compared to white male recruits.

The U.S. Navy's goal is to recruit 75% high quality individuals at a minimum but that percentage was decreased during tough recruiting years when state unemployment rates were low. As Commander Navy Recruiting Command stated in the Navy Recruiting Command's "Recruiting Force 2020 Strategy" (Commander Navy Recruiting Command, 2012b), the mission of Navy Recruiting is to—"Recruit the best men and women for America's Navy to accomplish today's missions and meet tomorrow's challenges." The Navy has seen and continues to see successful recruiting years since the Great Recession; however, if the best recruits are what the Navy desires, the policies and programs that support the recruiting force must place an increased emphasis on recruiters attracting those high quality individuals who can meet those challenges the U.S. Navy continues to face.

## **B. CONCLUSIONS**

The U.S. Navy Awards and Incentives System may be counter-productive in incentivizing recruiters to meet their Net Contract Objective goals. The average Navy recruiter is forced to make hard decisions when it comes to focusing their efforts on prospective recruits. Due to the challenging and dynamic nature of Navy recruiting, high quality recruits require more resources to attract. If recruiters have not made their recruit contract goals by the last week of the month, statistical analysis in this thesis shows that recruiters are highly likely to recruit a low quality individual because they are easier to recruit and are probably waiting on the recruiter's call to service. Although the current Navy Awards and Incentive System places an increased emphasis on the requirement to attract higher quality recruits, changes must be continually made to address the needs of the recruiting force

Enlisting low quality recruits do not come without a price. As the U.S. Navy becomes more fiscally prudent, the training dollars, administrative man-hours, and available recruiter time is becoming more stringent. The downsizing of the Navy manpower imposes a greater need to attract the higher quality military-eligible youth to meet the future needs of this diverse organization.

## **C. RECOMMENDATIONS**

### **1. Changes to the USN Recruiter Awards and Incentives System**

The results in this thesis suggest that a special bonus-point category within the Enlisted Recruiter Incentive System (ERIS) program that is only authorized to be earned during the last week of the month should be initiated. Recruiters would earn the bonus points for writing recruit contracts for recruits who have the lowest probability of being low quality during the last week of any given month. Also, to earn these points, recruiters must recruit a minimum number of high quality individuals during the month as determined by CNRC. These bonus points may then be applied to the individual recruiter's recruit contract record for competition in RCAP. As previously mentioned in Chapter II, RCAP provides selected candidates with immediate promotion. Recruiters earning immediate advancement also earn a reputation for being the best at their jobs.

This new special bonus-point program within the ERIS program should be implemented and simultaneously adopted with a change to the RCAP instruction's eligibility criteria. Nevertheless, most sailors, specifically recruiters, seek to achieve immediate promotion to the next pay grade through superior job performance. Further analysis into the proper promulgation of such a program is needed for a more informed decision for program creation and implementation.

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## **APPENDIX.**

Table A.1 exhibits the RIS point-based program available to recruiters based upon the quarterly AAA Instruction Notice distributed by CNRC. The point valuation is based upon updated recruit demographics and skills to reflect the desired recruit contract and accession goals to include dynamic manpower mission requirements of the U.S. Navy.

Table A.1. RIS Point-Based Program

Recruiter Incentive System(RIS)			
CATEGORY	SUBCATEGORY	POINTS	
New Contract	NCO	2	
	Prior Service	2	
Quality Bonus	TSC 1 (93-99)	3	
	TSC 2 (65-92)	2	
	TSC 3 (50-64)	1	
	FTCU	1	
Spec-ops Bonus	WC-SB/EOD/ND/AIRR/SO	1	
Nuke Bonus	Nuke	2	
NROTC	NROTC-Selected Application	1	
	NROTC-Selected	2	
Accession	SELRES Affiliation	2	
	General Officer/CEC	4	
	JAG	4	
	SO/Chaplain/Cyber Officer	8	
	Medical Officer	10	
Reductions	IM LOSS	2+Original Contract	
	1st Out Month Loss	1+Original Contract	
	2nd Out Month or greater	Original Contract	
	Spec-ops Reclassification(Preventable)	Original Contract	
	OCS Attrite(preventable)	-10	
Officer Processor Bonus	Officer Int to Kit <30 days	5	
	Officer Int to Kit <45 days	2	
CATEGORY	SUBCATEGORY	APPS to NRC	Selects
Active Officer	Reg GENOFF	1	2
	Nuke	2	4
	Chaplain /Student	3	6
	CEC	1	2
	JAG	1	2
	SPECWAR	1	2
	CWE/SEGA	2	4
Medical	Physician	4	8
	Dentist	4	8
	MSC	3	6
	Student	2	4
	Nurse	2	4
Other	Merchant Marine	3	6
Reserve Officer	GENOFF/CEC-Navet	4	8
NAVET-MED	Physician	4	8
	Dentist	4	8
	Nurse	4	8
DCO	GENOFF	3	6
DCO-Medical	Physician	5	10
	Dentist	4	10
	MSC	4	8
	Nurse	4	8



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